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(पहला पुनरीक्षण)

Indian Standard

FIBRE OPTIC BRANCHING DEVICES

PART 2 SECTIONAL SPECIFICATION — NON-WAVELENGTH SELECTIVE BRANCHING DEVICES

(First Revision)

ICS 33.180.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 2001

Price Group 10

Fibre Optics Sectional Committee, LTD 27

NATIONAL FOREWORD

This Indian Standard (Part 2) (First Revision) which is identical with IEC 875-2 (1992) 'Fibre optic branching devices — Part 2: Sectional specification — Non-wavelength selective branching devices' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Fibre Optics Sectional Committee and approval of the Electronics and Telecommunication Division Council.

This standard provides information and rules for the preparation of detail specifications for non- wavelength selective branching devices.

This standard was first published in 1993 and was identical to IEC 875-2 (1986) 'Fibre optic branching devices — Part 2: Sectional specification — Transmission star coupler'. IEC 875-2 (1986) has since been revised in 1992. The revision of this standard has been taken up to align it with the latest international practices.

The test of the IEC has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCES

The concerned technical committee responsible for preparation of this standard has reviewed the provisions of the following international publications and has decided that they are acceptable for use in conjunction with this standard:

IEC 410 (1973)	Sampling plans and procedures for inspection by attributes
IEC 875-1 (1992)	Fibre optic branching devices — Part 1: Generic specification

Only the English language text of the International Standard has been retained while adopting it in this Indian Standard.

IS 13616 (Part 2) : 2001
IEC 875-2 (1992)

Indian Standard

FIBRE OPTIC BRANCHING DEVICES

PART 2 SECTIONAL SPECIFICATION — NON-WAVELENGTH SELECTIVE BRANCHING DEVICES

(First Revision)

1 General

1.1 *Scope*

This sectional specification applies to branching devices which are non-wavelength selective.

These are sub-family 1 branching devices.

1.2 *Object*

The object of this specification is to provide information and rules for the preparation of detail specifications for non-wavelength selective branching devices including:

- related types;
- quality assessment procedure with the corresponding test schedule format;
- tests and measuring methods;
- blank detail specifications.

Since this sectional specification is applicable to many different branching device types, variants and styles, the housing configurations, dimensions, test and performance requirements will only be provided in the detail specifications.

The relationship of the generic specification with this subsidiary sectional specification and with the associated blank detail and detail specifications is given in annex A of IEC 875-1.

1.3 *Normative references*

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 410: 1973, *Sampling plans and procedures for inspection by attributes.*

IEC 875-1: 1992, *Fibre optic branching devices – Part 1: Generic specification.*

1.4 *Types of sub-family 1 branching devices*

Non-wavelength selective branching devices can be classified into the following basic types:

- i) transmissive star branching device (1.4.1)
  - a) N X M transmissive star branching device (1.4.1.1);
  - b) three-port directional branching device (1.4.1.2);
  - c) four-port directional branching device (1.4.1.3);
- ii) reflective star branching device (1.4.2);
- iii) combined reflective/transmissive star branching device (1.4.3).

Each of them is defined in terms of a circuit diagram and a general form of transfer matrix.

NOTES

1 The schematic diagrams which follow do not necessarily correspond to the physical layout of the branching device and its ports.

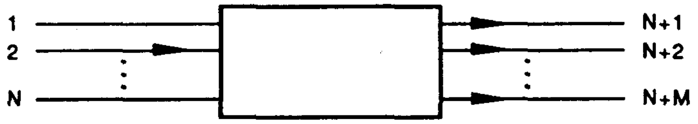
2 In the diagrams shown below, the arrows on the ports indicate the direction of travel of optical power. A port with no arrow is nominally isolated from the indicated input port.

3 For the definition of the transfer matrix, refer to 1.6.1.9 of the general specification (IEC 875-1).

4 The transfer coefficients are nominally equal to zero and nominally greater than zero. The nominal values of the transfer coefficients are indicated.

1.4.1 *Transmissive star branching devices*

1.4.1.1 *N X M transmissive star branching device*



This device has N input and M output ports. The two sets of ports are reversible insofar as if one of the "M" ports is used as an input, then the "N" ports are output ports. The signal is shared among all the M ports and the N ports are isolated from the signal. The transfer matrix describing the device is as follows:

Receive ports

$$\text{Launch ports}\quad\begin{array}{c|cccc|ccc|}
 & 1 & 2 & \cdots & N & N+1 & \cdots & N+M \\
\hline
1 & t_{11} & t_{12} & \cdots & t_{1N} & t_{1,N+1} & \cdots & t_{1,N+M} \\
2 & t_{21} & & & & & & \\
\vdots & \vdots & & & & & & \vdots \\
N & t_{N1} & & & & & & t_{N,N+M} \\
\hline
N+1 & t_{N+1,1} & & & & & & t_{N+1,N+M} \\
N+2 & t_{N+2,1} & & & & & & \\
\vdots & \vdots & & & & & & \vdots \\
N+M & t_{N+M,1} & & \cdots & t_{N+M,N} & t_{N+M,N+1} & \cdots & t_{N+M,N+M}
\end{array} \equiv \left[\begin{array}{c|c} A & B \\ \hline B & A \end{array}\right]$$

The transfer coefficients in zones A (which relate to isolated ports) are nominally equal to zero and those in zones B (which relate to conducting ports) are nominally greater than zero.

1.4.1.2 *Three-port directional branching device*

In this device, an optical signal is transferred from a specified input port (1) to two output ports (2 and 3). The transfer matrix describing the device is as follows:

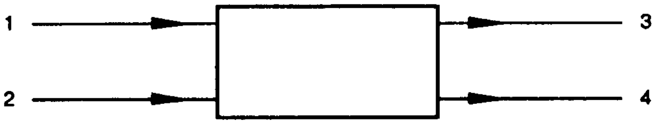
Receive ports

$$\text{Launch ports}\quad\begin{array}{c|ccc|}
 & 1 & 2 & 3 \\
\hline
1 & 0 & t_{12} & t_{13} \\
2 & t_{21} & 0 & 0 \\
3 & t_{31} & 0 & 0
\end{array}$$

The "splitting ratio" is defined to be the lesser of the ratio t_{13}/t_{12} or its reciprocal.

NOTE - This is a particular case of the transmissive star branching device with N = 1 and M = 2.

1.4.1.3 *Four-port directional branching device*



In this device, an optical signal is transferred from an input port to two output ports with the remaining port isolated. For example, if the input port is port 1, the optical signal is transferred to ports 3 and 4 with port 2 isolated.

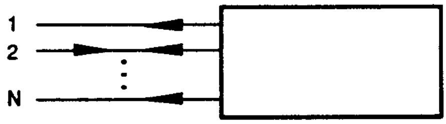
The transfer matrix describing the device is as follows:

$$\begin{array}{cc|cccc} & & \multicolumn{4}{c}{\text{Receive ports}} \\ & & 1 & 2 & 3 & 4 \\ \hline & 1 & 0 & 0 & t_{13} & t_{14} \\ \text{Launch ports} & 2 & 0 & 0 & t_{23} & t_{24} \\ & 3 & t_{31} & t_{32} & 0 & 0 \\ & 4 & t_{41} & t_{42} & 0 & 0 \end{array}$$

The "splitting ratios" are defined to be the lesser of the respective ratios t_{13}/t_{14} or its reciprocal and t_{23}/t_{24} or its reciprocal.

NOTE - This is a particular case of the transmissive star branching device with N = 2 and M = 2.

1.4.2 *Reflective star branching device*

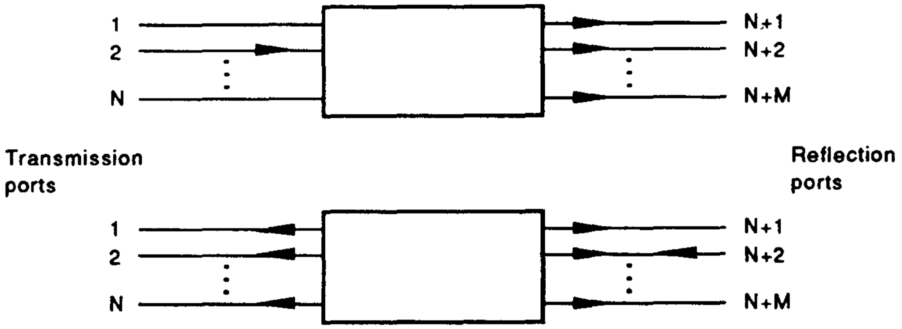


This device has N ports, all of which act as output ports regardless of which one is used as the input. The transfer matrix describing the device is as follows.

$$\begin{array}{cc|ccccc} & & \multicolumn{5}{c}{\text{Receive ports}} \\ & & 1 & 2 & . & . \; . & n \\ \hline & 1 & t_{11} & t_{12} & . & . \; . & t_{1N} \\ & 2 & t_{21} & & & & \\ \text{Launch ports} & . & . & & & & \\ & . & . & & & & \\ & . & . & & & & \\ & N & t_{N1} & . & . & . \; . & t_{NN} \end{array}$$

The transfer coefficients are all nominally greater than zero.

1.4.3 *Combined reflective/transmissive star branching device*



This device has two operationally different sets of ports, one set of N transmissive ports and one set of M reflective ports.

When one of the N transmissive ports is used as an input, the device acts as a transmissive star branching device, with the M ports acting as output ports and the N ports isolated from the signal. When one of the M reflective ports is used as an input, the device acts as a reflective star branching device, with all N + M ports acting as output ports.

The transfer matrix describing the device is as follows:

Receive ports

Launch ports

$$
\begin{array}{c|cccc|ccc|}
 & 1 & 2 & \cdots & N & N+1 & \cdots & N+M \\
\hline
1 & t_{11} & t_{12} & \cdots & t_{1N} & t_{1,N+1} & \cdots & t_{1,N+M} \\
2 & t_{21} & & & & & & \\
\vdots & \vdots & & & & & & \vdots \\
N & t_{N1} & & & & & & t_{N,N+M} \\
\hline
N+1 & t_{N+1,1} & & & & & \cdot & t_{N+1,N+M} \\
N+2 & t_{N+2,1} & & & & & \cdot & \\
\vdots & \vdots & & & & & & \vdots \\
N+M & t_{N+M,1} & \cdots & \cdots & t_{N+M,N} & t_{N+M,N+1} & \cdots & t_{N+M,N+M}
\end{array}
\equiv
\left[\begin{array}{c|c} A & C \\ \hline B & A \end{array}\right]
$$

The transfer coefficients in zone A (which relates to isolated ports) are nominally equal to zero and those in zones B and C are nominally greater than zero. Zones B and C relate to nominally conducting ports by reflection and transmission, respectively.

2 Quality assessment procedures

This clause provides practical information on quality assessment procedures to define the detail specification.

2.1 *Qualification approval/quality assessment systems*

The procedure for the examination and testing of branching devices are detailed in 2.4 and 2.5.

The selection, severity and periodicity of certain specialized tests are dependent upon the physical, optical and environmental characteristics of individual device styles, as indicated in each detail specification.

The applicability of any tests required is at the discretion of the specification writer and shall be indicated in the detail specification.

2.2 *Primary stage of manufacture*

Under consideration.

2.3 *Structurally similar components*

The term "structurally similar components" defines those components of a sub-family that may be grouped together within a specification for qualification approval and quality conformance inspection, as given in 2.3 of IEC 875-1. The non-wavelength selective branching devices are considered as structurally similar for the purposes of sampling inspection provided that they are:

- of common principle of cable attachment;
- such that the results of a given test, carried out on one of these components, can be regarded as valid for the other structurally similar components;
- produced by one manufacturer using essentially the same design, materials, process and methods.

2.4 *Qualification approval requirements*

The procedure for qualification approval testing are given in 2.4, 2.5 and 2.6 of IEC 875-1. The detail specification shall specify which of the two procedures is to be used.

2.4.1 *Fixed sample size procedure*

The procedure using a fixed sample size schedule is given below.

2.4.1.1 *Sampling*

A sample shall consist of a device as defined in the detail specification. The sample shall be representative of the range of devices for which approval is sought. This may or may not be the complete range covered by the detail specification.

The proportion of specimens having different characteristics shall be proposed by the manufacturer's chief inspector and shall be to the satisfaction of the national supervising inspectorate.

Spare specimens are permitted to replace specimens which are defective because of incidents not attributable to the manufacturer.

The number of specimens required shall be in accordance with the test schedules (equal to the total of samples per group).

2.4.1.2 *Testing*

The complete series of the tests specified in the detail specification is the minimum required for the approval of branching devices covered by this sectional specification and shall satisfy the performance requirements therein.

The whole sample shall be subjected to the tests of Group "0" and then divided for the other groups.

"One defective" is counted when a device has not satisfied the whole or a part of the tests of a group.

Approval is granted when the number of defectives does not exceed the number of permissible defectives specified.

2.4.1.3 *Test schedule format*

The test schedule format for qualification approval is given in table 1. An example is given in annex A.

Table 1 – Fixed sample test schedule format for qualification approval

Fixed sample tests	Reference IEC 875-1 (clause or subclause)	Sample size and criterion of acceptability (see note)		
		n	*c*	*t*
Group 0				
....				
•				
•				
•				
....				
Other groups				

NOTE - *n* = sample size;

c = group acceptance criterion (permitted number of defectives per group);

t = total acceptance criterion (permitted number of defectives for several groups combined).

2.4.2 *Lot-by-lot and periodic procedure*

The procedure to be used for qualification approval testing on the basis of lot-by-lot and periodic testing is given in 2.5 in this specification.

2.5 *Quality conformance inspection*

The procedures for quality conformance inspection are given in 2.5 of the generic specification IEC 875-1.

2.5.1 *Formation of inspection lots*

a) *Group A and B inspection*

These tests shall be carried out on a lot-by-lot basis.

A manufacturer may aggregate the current production into inspection lots subject to the following safeguards:

- the inspection lot shall consist of structurally similar devices in accordance with 2.3 of this specification;
- the sample tested shall be representative of the type, criteria and dimensions contained in the inspection lot. If there are less than five of any one type in the sample, the basis for selection of samples shall be agreed between the manufacturer and the national supervisory inspectorate.

b) *Group C and D inspection*

These tests shall be carried out on a periodic basis. Samples shall be representative of current production of the specified period.

2.5.2 *Quality assessment levels*

The minimum quality assessment levels, i.e. inspection level, acceptable quality levels, grouping, sampling and periodicity are given in the detail specification.

2.5.3 *Test schedule formats*

The test schedule formats for lot-by-lot and periodic tests for quality conformance inspection are given in tables 2 and 3. An example is given in annex A.

NOTE - Inspection levels (IL) and quality acceptance levels (AQL) are selected from IEC 410.

Table 2 – Group A and B inspection

Quality conformance tests	Reference IEC 875-1 (clause or subclause)	Inspection level (see note)					
		Level A		Level B		Level C	
		IL	*AQL*	*IL*	*AQL*	*IL*	*AQL*
Group A (lot-by-lot tests) …………………… • • • ……………………							
Group B (lot-by-lot tests) …………………… • • • ……………………							

NOTE – *IL* = inspection level;
AQL = acceptance quality level.

Table 3 – Group C and D inspection

Quality conformance tests Periodic tests	Reference IEC 875-1 (clause or subclause)	Inspection level (see note)											
		Level A				Level B				Level C			
		p	*n*	*c*	*t*	*p*	*n*	*c*	*t*	*p*	*n*	*c*	*t*
Group C (periodic) …………………… • • • ……………………													
Group D (periodic) …………………… • • • ……………………													

NOTE – *p* = periodicity (in months);
n = sample size;
c = group acceptance criterion (permitted number of defectives per group);
t = total acceptance criterion (permitted number of defectives for several group combined).

2.6 *Certified records of released lots*

Where certified records of released lots are prescribed in the detail specification, these shall be prepared in accordance with 2.6 of IEC 875-1. Where appropriate, the detail specification shall give all information necessary concerning the format production and certification of their certified records.

2.7 *Delayed delivery*

When, according to the procedures of 2.7 of IEC 875-1, a re-inspection is necessary, the Group A inspection shall apply.

3 Tests and measuring methods

Details of the tests and measuring methods are included in IEC 875-1. The tests required shall be specified in the detail specification.

4 Blank detail specification

4.1 *Function of a blank detail specification*

This blank detail specification prescribes the standard format for stating the essential information relating to or affecting the operational parameters and quality assessment requirements for all components of this branching device sub-family.

4.2 *Instructions for completion of a detail specification*

Spaces are provided for entering essential information in this blank detail specification. The spaces are identified by numbers between brackets. The contents of these numbered spaces are identified below. The spaces shown in this blank detail specification are only an example, since they will vary from one detail specification to another, depending on the amount of information that is to be filled in.

However, only tests that are applicable to an individual device *shall be entered* when establishing its corresponding detail specification.

Identification of the detail specification

(1) The name(s) of the national organization under whose authority the detail specification is drafted.

(2) The IEC number of the blank detail specification, followed by "IEC" and the allotted number for the detail specification.

(3) The number and issue number of the international generic and sectional specifications.

(4) The national number of the detail specification, date of issue and any additional information required by the national system.

(5) *Identification of component*

Enter the details as defined in item (5) of 4.3.

The term "function" shall include a short description of the function of the components including its principle of operation.

(6) *Classification characteristics*

Enter the characteristics as defined in item (6) of 4.3.

(7) *Safety warning*

Provide information as defined in the generic specification.

(8) *Dimensions and mounting details*

Show the maximum envelope dimensions of the relevant body style including positions of fibre pigtails or connectors. The outline drawing and mounting details shall be reproduced in the spaces provided. Variants requiring alternative outline dimensions shall be listed in tabular form.

(9) *Applicable tests*

The applicable tests for quality conformance inspection and qualification approval shall be entered in the spaces provided, in accordance with the test schedule formats given. Refer also to the example given in annex A.

Not applicable tests for a particular device type shall be either not listed or marked "NA".

(10) *Supplementary information*

Enter supplementary information in accordance with the following requirements:

- marking;
- ordering information;
- related documents (additional to those listed);
- requirements for certified records of released lots;
- structural similarity.

(11) *Tests details and requirements*

Reference data for the ratings and characteristics of the device in accordance with requirements shall be listed. Deviations from the minimum requirements listed shall be clearly indicated.

The information relevant to each of the variants covered by the detail specification shall include:

- connector types applicable to each variant;
- cable and/or fibre types applicable to each variant;
- alternative environmental protective finishes;
- details of alternative mounting flanges having either tapped or plain mounting holes.

4.3 *Specification format*

(1) NATIONAL ORGANIZATION

....

(2) Page ....

of .... IEC ....

(3) **COMPONENT OF ASSESSED QUALITY**
in accordance with:
– GENERIC SPECIFICATION: ....

– SECTIONAL SPECIFICATION: ....

(4) ....

....

Issue ....

(5) DETAIL SPECIFICATION FOR NON-WAVELENGTH SELECTIVE FIBRE OPTIC BRANCHING DEVICES

Type ....

Function ....

Number of operating wavelength ranges ....

Special features ....

(6) *Classification characteristics*

Optical properties

Insertion loss between conducting ports .... dB max.

Return loss .... dB min.

Isolation .... dB min.

Polarization sensitivity .... dB max.

Operating wavelength ranges .... nm to .... nm

.... nm to .... nm

Style and variant

Housing shape ....

Port type (variant) ....

Port orientation ....

Fibre type ....

Cable type ....

Connector type ....

Climatic classification ....

Quality assessment level ....

Other ratings and characteristics as required ....

(7) SAFETY WARNING

Care should be taken when handling small diameter optical fibre to prevent it from puncturing the skin, especially in the eye area.

Direct viewing of the end of an optical fibre when it is propagating energy is not recommended unless prior assurance has been obtained as to the safe energy output level.

(8) *Outline drawings*

Dimensions

	mm		
Ref.	Min.	Max.	Notes

Mounting details

(9) *Tests for quality approval and quality conformance inspection*

Fixed sample tests	Reference IEC 875-1 (clause or subclause)	Sample size and criterion of acceptability		
		n	*c*	*t*
Group 0				

Quality conformance tests	Reference IEC 875-1 (clause or subclause)	Inspection level					
		Level A		Level B		Level C	
		IL	*AQL*	*IL*	*AQL*	*IL*	*AQL*
Group A (lot-by-lot tests)							

Quality conformance tests Periodic tests	Reference IEC 875-1 (clause or subclause)	Inspection level											
		Level A				Level B				Level C			
		p	*n*	*c*	*t*	*p*	*n*	*c*	*t*	*p*	*n*	*c*	*t*
Group C (periodic)													

(10) *Supplementary information*

Component marking

Manufacturer's part number

Manufacturer's identity mark

Manufacturing date code (year/week)

Additional marking such as port identification

Component package marking

IEC type designation

Manufacturer's part number

Manufacturer's identity mark

Manufacturing date code

Manufacturer's factory identification code

Quality assessment level

Reference number of certified record of released lots

Additional marking such as instruction for assembling and a prominent warning of the necessary safe working practices.

Ordering information

Detail specification number

Quality assessment level code letter

Related documents

A future IEC publication dealing with safety.

Others (where required)

Requirements for certified records of released lots

Structural similarity

(11) *Test details and requirements*

General	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Visual inspection	3.3		
Dimensions and mass	3.4		
NOTE - D = destructive; N = non-destructive.			

Optical	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Insertion loss	3.5.2		
Method number			
Fibre type			
Fibre lengths (L1, L2 ...)			
Launch conditions			
Cladding mode stripper			
Temporary joint			
Reference fibre			
Reference connector			
Reference branching device			
Source unit			
Excitation unit			
Detector unit			
Deviations			
Spectral dependence of the transfer coefficients	3.5.3		
Method number			
Fibre type			
Fibre lengths (L1, L2 ...)			
Launch conditions			
Cladding mode stripper			
Temporary joint			
Reference fibre			
Reference connector			
Reference branching device			
Source unit			
Excitation unit			
Wavelength selective element			
Detector unit			
Deviations			
Polarization dependence of the transfer coefficients	3.5.4		
Method number			
Fibre type			
Fibre lengths (L1, L2 ...)			
Launch conditions			
Cladding mode stripper			
Temporary joint			
Reference fibre			
Reference connector			
Reference branching device			
Source unit			
Excitation unit			
Monochromator			
Detector unit			
Deviations			

NOTE - D = destructive; N = non-destructive.

Optical	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Modal dependence of the transfert coefficients (Under consideration)	3.5.5		
Monitoring of insertion loss	3.5.6		
Fibre type Fibre length (L1, L2 ...) Launch conditions Cladding mode stripper Temporary joint Reference fibre Reference connector Reference branching device			
Source unit Power output Peak wavelength Spectral width Coherent/incoherent Power stability Fibre pigtail type			
Excitation unit Launch conditions			
Detector unit Maximum sensitivity Linearity Peak wavelength sensitivity Wavelength sensitivity range Stability Fibre pigtail type			
Deviations			
Susceptibility to ambient light coupling	3.5.7		
Source unit Chopper Optical scattering plate Integration sphere Detector unit Deviations			
Maximum power capability	3.5.8		
Continuous wave duration Deviations Measurements			
Modal noise (Under consideration)	3.5.9		

NOTE - D = destructive; N = non-destructive.

Mechanical	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Vibrations	3.6.2		
Fibre type			
Cable type			
Connector type			
Cable length			
Supports and anchorage			
Frequency range			
Duration			
Deviations			
Measurements			
Bump	3.6.3		
Fibre type			
Cable type			
Connector type			
Cable length			
Supports and anchorage			
Acceleration			
Pulse duration			
Number of cycles			
Deviations			
Measurements			
Shock	3.6.4		
Fibre type			
Cable type			
Connector type			
Cable length			
Supports and anchorage			
Acceleration			
Pulse duration			
Number of cycles			
Deviations			
Measurements			
Acceleration, steady state	3.6.5		
Fibre type			
Cable type			
Connector type			
Cable length			
Supports and anchorage			
Mounting and orientation			
Acceleration			
Duration			
Deviations			
Measurements			

NOTE - D = destructive; N = non-destructive

Mechanical	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Impact	3.6.6		
Specimen orientation			
Hammer face radius			
Hammer mass			
Drop height			
Point of impact			
Number of impacts			
Deviations			
Measurements			
Drop test	3.6.7		
Fibre type			
Cable type			
Connector type			
Cable length			
Supports and anchorage			
Severity			
Duration			
Deviations			
Measurements			
Crush resistance	3.6.8		
Fibre type			
Cable type			
Connector type			
Cable length			
Test surface material and hardness			
Pad material and hardness			
Load			
Duration			
Specimen orientation			
Deviations			
Measurements			
Pulling	3.6.9		
Cable type			
Connector type			
Cable length			
Tensile force value			
Rate of application			
Duration			
Deviations			
Measurements			

NOTE - D = destructive; N = non-destructive

Mechanical	Reference CEI 875-1 (clause or subclause)	Remarks and requirements	N/D
Axial compression	3.6.10		
Cable type Cable length Compressive force value Rate of application Point of application Duration Deviations Measurements			
Torsion	3.6.11		
Cable type Connector type Cable length Torque value Point of application Duration of application Deviations Measurements			
Nutation	3.6.12		
(Under consideration)			
Storage life	3.6.13		
(Under consideration)			
NOTE - D = destructive; N = non-destructive.			

Environmental	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Cold	3.7.2		
Fibre type			
Cable type			
Connector type			
Cable length			
Temperature			
Duration			
Deviations			
Measurements			
Dry heat	3.7.3		
Fibre type			
Cable type			
Connector type			
Cable length			
Temperature			
Duration			
Deviations			
Measurements			
Damp heat, steady state	3.7.4		
Fibre type			
Cable type			
Connector type			
Cable length			
Temperature			
Relative humidity			
Duration			
Deviations			
Measurements			
Climatic sequence	3.7.5		
Fibre type			
Cable type			
Connector type			
Cable length			
Low temperature			
High temperature			
Duration of damp heat			
Pre-conditioning procedure			
Test method number			
Deviations			
Measurements			

NOTE - D = destructive; N = non-destructive.

Environmental	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Condensation	3.7.6		
Fibre type			
Cable type			
Connector type			
Cable length			
Low temperature			
High temperature			
Rate of temperature change			
Number of cycles			
Deviations			
Measurements			
Rapid change of temperature	3.7.7		
Fibre type			
Cable type			
Connector type			
Cable length			
Low temperature			
High temperature			
Rate of temperature change			
Number of cycles			
Deviations			
Measurements			
High temperature endurance	3.7.8		
Fibre type			
Cable type			
Connector type			
Cable length			
Temperature			
Duration			
Deviations			
Measurements			
Sealing	3.7.9		
Fibre type			
Cable type			
Connector type			
Cable length			
Duration			
Deviations			
Measurements			

NOTE - D = destructive; N = non-destructive.

Environmental	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Immersion	3.7.10		
Fibre type			
Cable type			
Connector type			
Cable length			
Pressure			
Duration			
Deviations			
Measurements			
Corrosive atmosphere (Salt mist)	3.7.11		
Fibre type			
Cable type			
Connector type			
Cable length			
Duration			
Deviations			
Measurements			
Industrial atmosphere	3.7.12		
Fibre type			
Cable type			
Connector type			
Cable length			
Duration			
Deviations			
Measurements			
Flammability	3.7.13		
Fibre type			
Cable type			
Connector type			
Point of application			
Duration of exposure			
Deviations			
Measurements			
Mould growth	3.7.14		
Duration			
Deviations			
Measurements			

NOTE - D = destructive; N = non-destructive.

Environmental	Reference IEC 875-1 (clause or subclause)	Remarks and requirements	N/D
Low air pressure	3.7.15		
Fibre type Cable type Connector type Duration Deviations Measurements			
Solar radiation	3.7.16		
Fibre type Cable type Connector type Deviations Measurements			
Nuclear radiation	3.7.17		
Resistance to solvents and contaminating fluids	3.7.18		
Fibre type Cable type Connector type List of fluids Deviations Measurements			

NOTES

1 Where return loss coefficients are required under the optical tests, additional test details should be added using additional copies of the appropriate pages of the blank detail specification.

2 The following measurements should be required before, during (if applicable) and after the environmental or mechanical tests:

- inspection of physical damage;
- transfer matrix coefficient(s);
- other performance parameters (if applicable).

3 D = destructive; N = non-destructive.

Annex A
(informative)

Example of test schedule for non-wavelength selective branching devices

Table A.1 – Fixed sample test schedule for qualification approval

Tests	Reference IEC 875-1 (clause or subclause)	Sample size and criterion of acceptability		
		n	*c*	*t*
Group 0				
– Visual examination	3.3	20	0	
– Dimensions and mass	3.4			
– Insertion loss	3.5.2			
Group 1				
– Pulling	3.6.9	4	0	
Group 2				
– Cold	3.7.2	4	0	
– Dry heat	3.7.3			
– Damp heat, steady state	3.7.4			
Group 3				
– Vibrations	3.6.2	4	0	
– Climatic sequence	3.7.5			
Group 4				
– Shocks	3.6.4	2	0	
Group 5				
– Salt mist	3.7.11	2	0	

NOTE - *n* = sample size;

c = group acceptance criterion (permitted number of defectives per group);

t = total acceptance criterion (permitted number of defectives for several groups combined).

Table A.2 – Group A and B inspection

Quality conformance tests	Reference IEC 875-1 (clause or subclause)	Inspection level					
		Level A		Level B		Level C	
		IL	*AQL*	*IL*	*AQL*	*IL*	*AQL*
Group A (lot-by-lot tests)							
A1 – Visual inspection	3.3			S3	4		
A2 – Dimensions and mass	3.4			S3	4		
Group B (lot-by-lot tests)							
B1 – Insertion loss	3.5.2			S3			

NOTE – *IL* = inspection level;
AQL = acceptance quality level.

Table A.3 – Group C and D inspection

Quality conformance tests	Reference IEC 875-1 (clause or subclause)	Inspection level											
		Level A				Level B				Level C			
		p	*n*	*c*	*t*	*p*	*n*	*c*	*t*	*p*	*n*	*c*	*t*
Group C (periodic)													
C1 – Pulling	3.6.9					12	3	0					
C2 – Shock	3.6.4					12	3	0					
Group D (periodic)													
D1 – Cold	3.7.2												
Dry heat	3.7.3					24	3	0					
Damp heat, steady state	3.7.4												
D2 – Vibrations	3.6.2					24	3	0					
Climatic sequence	3.7.5												
D3 – Salt mist	3.7.11					24	3	1					

NOTE – *p* = periodicity (in months);
n = sample size;
c = group acceptance criterion (permitted number of defectives per group);
t = total acceptance criterion (permitted number of defectives for several groups combined).

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This Indian Standard has been developed from Doc : No. LTD 27 (1839).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at Prabhat Offset Press, New Delhi-2